An Automated System for Film Processor Quality Control

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Background: The daily quality assurance of film processors in a large medical institution is particularly time consuming, producing approximately 6000 measurements per year in our institution. Quality assurance is federally mandated for mammography film processors and required by most hospital accrediting agencies for all other film processors. For the 23 processors at our institution this requires a minimum of three hours and often upwards of four hours per day. The data is acquired on a 1 1/2 to 2 hour trip. After evaluation and recording, which requires 30 to 45 minutes, a second 45 minute to 1 hour trip is required to return paper chart results to each individual processing area. These results are essential if processor troubleshooting is required. The time estimates assume that no problems are encountered. It is obvious that a system with direct data input from each processor area, instant analysis, and remote and on-site retrieval of recent and baseline data would enormously streamline this system. The purpose of this communication is to demonstrate a system which is the first step towards this goal.

System: This system was developed by applying reliable database, data analysis, and networking technology to the management of film processor sensitometry data. The Macintosh platform was chosen for implementation due to its facilities for interapplication communication, standardized scripting features, and clean user interface.

Processor reports, including charts of speed, contrast, and background for the past thirty days, film characteristic curves, maintenance summaries, and comments, can be output in printed form, as text files with simple ASCII graphs (for integration with text-based dumb-terminal networks), and as HTML and GIF files (for web-based delivery).

Daily processor data can be entered, analyzed, and displayed through the world wide web using a simple system of CGI scripts and any Macintosh web server. A robust scripting interface is also provided for highly customizable integration with web servers, terminal emulators, or any other collaboration or content-delivery mechanism.

The program is designed to evaluate the daily measured data, determine if it lies within control limits, and establish the existence of trends which may be due to faulty components or inadequate control settings.

Evaluation: In pilot performance this system has saved approximately 2 to 2 1/2 hours per day with the added advantage of providing instant data retrieval from any networked location in the world, allowing for remote troubleshooting. The trend spotting algorithm removes the element of operator uncertainty and gives excellent early warning of impending failure.

Conclusions: The system is more efficient, convenient, accurate, and responsive than the common manually based system.